OULU UNIVERSITY OF
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Environmental Responsibility Guide for Business Students & Enterprises

Climate Change and Biodiversity Loss Mitigation

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ABSTRACT

Oulu University of Applied Sciences
Degree in International Business

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The thesis attempts to raise the awareness of business role in climate change and biodiversity loss mitigation by describing the scope of environmental responsibility in different departments. It is commissioned by Oulu University of Applied Sciences in cooperation with WWF and designed as a part of Environmental Responsibility (5 cr.) course material.

The study is comprised of three main parts: theoretical analysis of environmental responsibility in business, its scope and application based on the case studies, and a testing material for students and business representatives. The student questionnaire is based on the statistical data and facts about the climate and biodiversity conditions obtained from the Living Planet Report 2018. The business questionnaire is not limited to the scope of the Living Planet Report and contains questions on possible approaches to mitigation strategies.

Consequently, the main objective of the guide is to introduce the reader to environmental responsibility on different levels of business operations and examine its width and applications. As a material for business students, it is set to increase the level of awareness in the future decision-makers.

To achieve the set objectives, company interactions with biodiversity and ecosystem services, potential direct and indirect impacts, as well as means of regulating them through internal assessments and public engagement are analyzed. Moreover, the corporate barrier factors to implementation of mitigation strategies are briefly described. The research consists of secondary data analysis based on the sustainability reports of 6 Finnish companies representing the food, paper, and travel & transportation industry. The choice of their environmental strategies is further justified by the theoretical framework and industry specifics. The thesis recognizes the importance of both business ethics and potential opportunities discovered by climate change adaptation and mitigation activities.

The research proved that, depending on the industry and specific activities, the objectives and approaches to environmental responsibility vary. The potential development areas in the chosen companies are market education and biodiversity management activities.

Keywords: environmental responsibility, climate change, ecosystem services, biodiversity, sustainability

CONTENTS

1 INTRODUCTION

Nowadays, climate and biodiversity are exposed to excessive pressure from the consumer behavior and business practices. In fact, only one fourth of our planet is free of the influence of human activities (Living Planet Report 2018, 42). There is a certain link between what the companies support and promote and how they influence values and buying behavior of their clients (Herrmann & Guenther, 2017, 45). Thus, the current environmental footprint of production and consumption can be reduced by both the company's internal operations and public relations. One of the big issues is the lack of awareness about not only the need to change the practices, but also the methods to assess and implement this change. Herrmann and Guenther (2017, 43) describe it as a corporate knowledge barrier to climate change adaptation in enterprises. With this thesis, I hope to contribute in overcoming this barrier.

As an International Business student, I want to have an impact on the future of business practices, which served as the main reason for choosing the topic. Considering that OAMK is a practice-based university, case studies on environmental responsibility in enterprises could be of help for other international business students – the future decision-makers.
As a way to acknowledge the importance of education on the future of business, the thesis will also set a connection between the level of awareness on the business practices. Ideally, it will outline a chain of consequences starting with education and its impact on business, resulting in environmental footprint and its impact on biodiversity.

1.1 Methodology

Seeing that the thesis is supposed to be used as a part of the OAMK Environmental Responsibility (Ympäristövastuullisuus, 5 cr.) course material, the development task would be to create a material for students and businesses that includes both theoretical background and practical implications, with possibility to learn and test their knowledge.
The chosen thesis topic would serve as an up-to-date explanation of mitigation activities, based on the Living Planet 2018 Data by World Wildlife Fund (WWF) and systematic analysis of the currently used tools and initiatives in different industries. Ideally, the material will visualize the results of the current statistics and provide an overlook on the existing environmental responsibility practices that

proved effective in the performance of the chosen organizations. Thus, the research questions are: What environmental initiatives do the chosen companies have? Why are they efficient, based on the industry analysis?

The purpose of the thesis is to set a connection between different business practices, their effect on the environment and, consequently, biodiversity, as well as outline the existing tools and solutions. The readers will be given an opportunity to test their understanding of the material upon the completion of parts with theoretical background and research results analysis.

1.2 Literature

As previously mentioned, Living Planet Report 2018 serves as the main source for the statistical figures and claims in the thesis. The link between different industries as well as their impact on climate and wildlife are supported by quantitative data, which will potentially solidify the claims. The Living Planet Report 2018 and environmental frameworks suggested by WWF will be extensively examined over the course of this work, while other academic materials will be used to support or challenge the claims of the main source.

Due to the lack of research on the impact of education on sustainability awareness, Article 21, Chapter 36 by UN (2002) serves as validation for the topic choice and its significance on not only the future business outcomes, but also sustainable development as a whole. It claims that "Education is critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making." Moreover, Quality Education is the 4th Sustainable Development goal (United Nations, 2015). Thus, contributing to raising the awareness about sustainability-related issues in this thesis improves the performance and directly affects one of the SD objectives.

Finally, *Accounting for changes in biodiversity and ecosystem services from a business perspective* (Houdet et al., 2009) and *The selection of biodiversity indicators for business landholdings* (Hildreth, 2012) will be presented as the main sources in the claims related to biodiversity management.

2 CLIMATE ACTION ON THE MACRO-LEVEL

The key definitions part is comprised of two sub-chapters that justify the research problem choice and stress the importance of environmental awareness. Thus, the theoretical background is set to explain the concepts on a wide scale, in contrast to chapter 3 where the problem and relevant solutions are examined from the business perspective.

2.1 Sustainable Development

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987, 16). Even though Brundtland Commission was the first to mention the concept, it is the most quoted and commonly used definition of sustainability, according to the International Institute of Sustainable Development (2019, cited 18.02.2019).

The concept is formed by equally important dimensions of the economy, society, and environment, defined by John Elkington (1994, 3) as the triple bottom line and widely used in the corporate responsibility accounting. In September 2015, 17 sustainable development goals were identified on the UN Sustainable Development Summit to improve and ensure stable performance of each of the mentioned dimensions (UN, 2015, cited 18.02.2019). These goals are:

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities

12. Responsible Production and Consumption
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnership of The Goals

As the thesis is focused on the connection between business, education, climate and biodiversity, it will increase the awareness and indirectly contribute to the goals #4 (Quality Education), #13 (Climate Action), #14 and #15 (Life Below Water and On Land).

According to Living Planet Report (2018, 22), some facets of the society have improved on the global scale. For example, the average life expectancy was estimated at 70+ years, due to the advances in disease prevention, availability of medication, lower child mortality rates and general access to healthcare, as well as reduction of poverty. However, these advances were not reached in a sustainable manner, i.e. the current level of consumption empowered by the growing middle class leads to the resource depletion. As mentioned in the Living Planet Report 2018, this phenomenon is also referred to as the Great Acceleration. To support this claim, the global Ecological Footprint, or the amount of demand human consumption places on nature, has increased by 190% in the last 50 years (ibid.). The *Figure 1* presented below shows the correlation between the Human Development Index (education level, life expectancy, income) and the growth of the Ecological Footprint per capita.

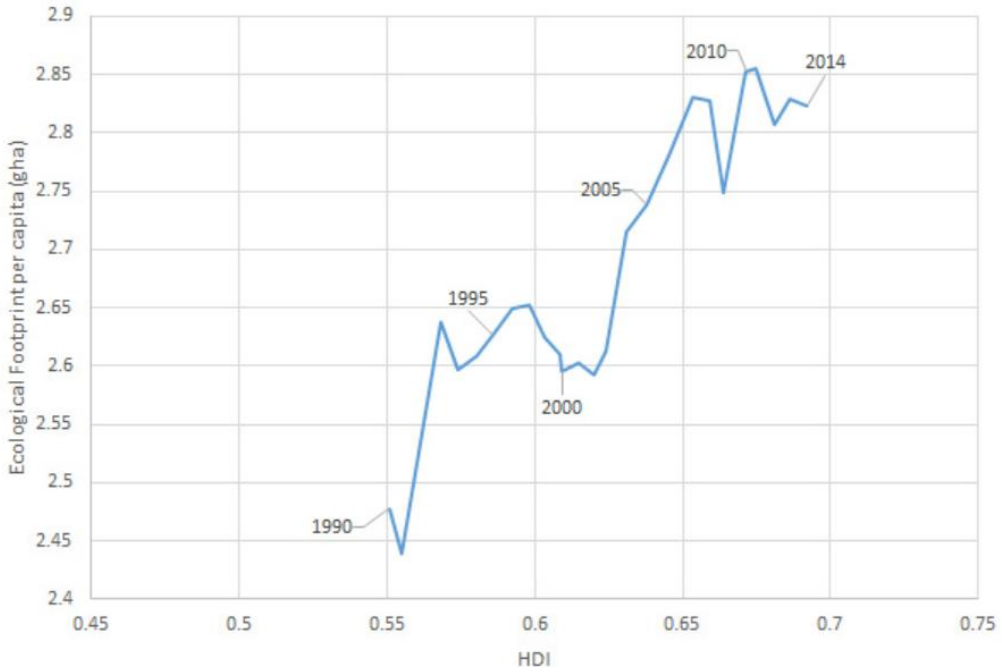

FIGURE 1. World Average Ecological Footprint - Human Development Index, 1990-2014 (Global Footprint Network, cited 18.01.2019)

Since the accounting method for Ecological Footprint calculation includes assessment of the global demand on nature, it can be concluded that the growing quality of life increases the buying power and consumption rates, thus amplifying the pressure on the Earth's natural resources. With this trend, it can be assumed that the natural resources and environmental conditions may not be able to support the future generations, which contradicts the primary mission of the sustainable development goals, as defined by the United Nations (2019, cited 19.02.2019).

2.2 Circular Economy

One of the currently growing solutions is integrating the circular economy into the everyday lives and business activities. Essentially, it stands for reusing or repairing the currently owned products, recycling the products after the maintenance is no longer possible, utilizing the recycled materials for the re-designed items, and passing it to the retailers and customers who are expected to repeat the circle (World Economic Forum, 2019, cited 20.02.2019). Its full cycle can be seen from the Figure 2, where the process is especially visible on the example of technical materials.

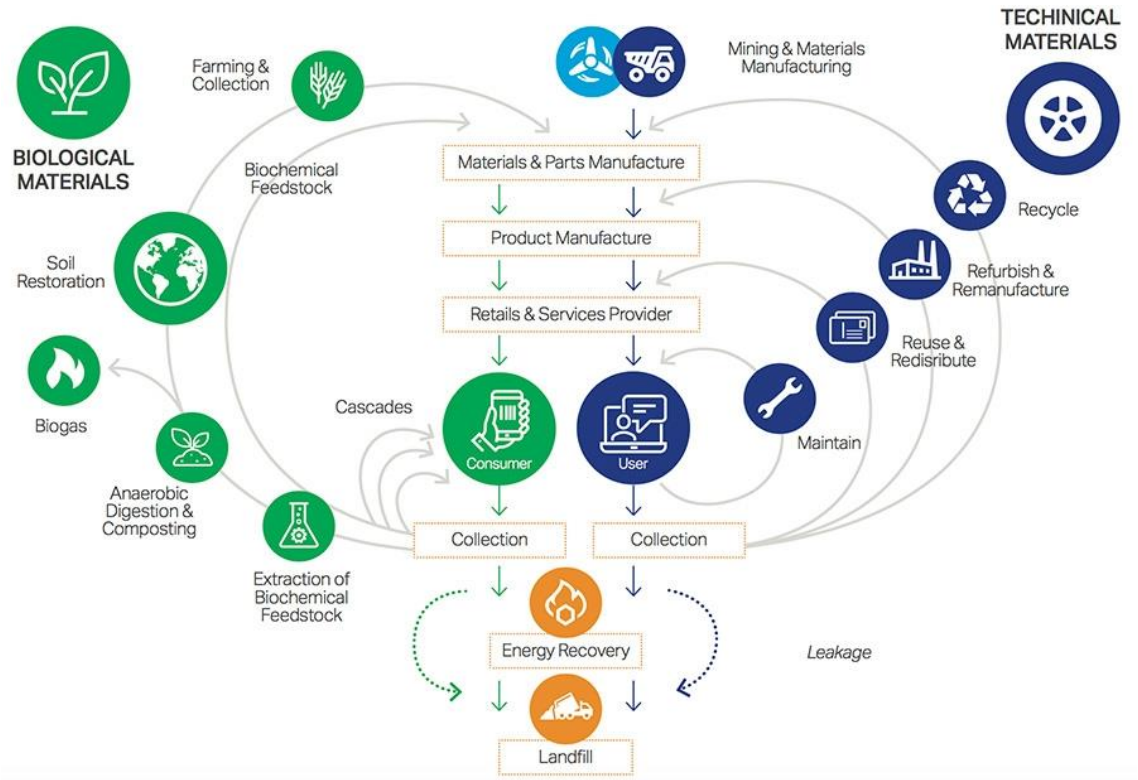

FIGURE 2. The Circular Economy - an industrial system that is restorative by design (Ellen MacArthur Foundation, cited 29.03.2019)

Moreover, renting products instead of purchasing is one of the aspects supported by the ideology. Nowadays, many businesses, such as Airbnb (rental), Timberland and Adidas (use of recycled materials) are integrating circular systems into their business (Lifegate, 2017, cited 23.03.2019; Adidas, 2018, cited 23.03.2019). Reebok picked another strategy by using biodegradable materials in the Cotton + Corn collection first released in 2018 (Reebok, 2018, cited 23.03.2019).

As can be seen from the Figure 3, the growing awareness of the circular economy has led to substantial decrease in the demand for different materials. Even with the growth of the middle-class and, thus, the consumption power, the transition from the linear to circular consumption has decreased the negative effects on the environmental conditions.

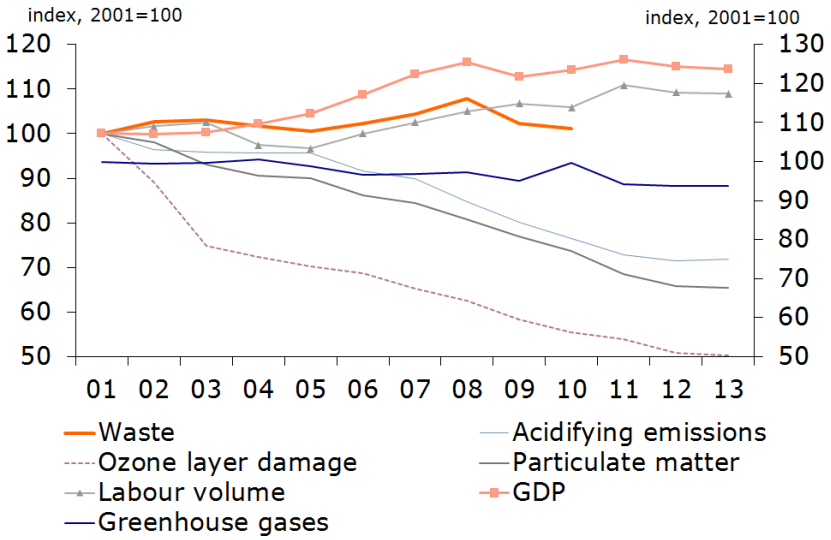

FIGURE 3. Absolute decoupling of growth and environment (Stegeman, 2015, cited 18.02.2019)

2.3 Climate & Biodiversity

To start with, nature is not only the home for the living organisms, but also a valuable source of different resources needed for our survival: food, drinkable water, air, soils, and shelter (Living Planet Report, 2018, 16). Moreover, it is the origin of various materials humans use as the means of production or fuel source (DEFRA, 2007, 11). The full list of ecosystem services can be found in the Appendix 1. If quantified, all of the mentioned services are estimated at US$125 trillion each year (2018, 10).

With human well-being requiring constant supply of natural services (Millennium Ecosystem Assessment, 2005, cited 21.02.2019) and the rising Global Land-Temperature Index (NASA, 2019, cited 21.02.2019) which could sacrifice such access, both personal lifestyle and business practices might have to change. Unless reversed, the climate change, as the change in long-term statistics of weather conditions in a chosen region (Shepherd, Dr. J. Marshall, 2005, cited 23.02.2019), poses threats to humans and other organisms living on Earth. Seeing that, climate change has been recognized as one of the biggest challenges on the global scale (Hutt, 2016, cited 23.02.2019).

Biodiversity (or biological diversity) can be shortly defined as the “variability among living organisms from all sources and the ecological complexes of which they are part” (United Nations, 1992, 3). Nevertheless, the term is frequently seen as embracive and, as noted by Gaston (1996,195-205), abstract and difficult to comprehend. There is a myriad of consequences of biodiversity loss for humans, in addition to the cultural perspective and ethics. For example, food security might be in

danger of losing resilience to environmental factors if the genetic diversity is not supported in agriculture; the resources for medical research and medicine derived from other species might be lost; the vulnerability to infectious diseases and the outbreak patterns might change and increase their likelihood (COHAB, 2010, 1-2) .

It is important to note that climate and biodiversity are interlinked (Convention on Biological Diversity, 2019, cited 25.02.2019), meaning that the measures taken to adapt to or mitigate the effects of climate change can have a positive impact on the survival of species as well. In fact, Living Planet Report (2018, 74) names climate change as one of the biggest threats to biodiversity, along with habitat degradation, species over-exploration, invasive species, and pollution.

3 ENVIRONMENTAL RESPONSIBILITY & MANAGEMENT

Environmental Management System (EMS) is defined as "a system and database which integrates procedures and processes for training of personnel, monitoring, summarizing, and reporting of specialized environmental performance information to internal and external stakeholders of a firm" (Sroufe, 2003). In this chapter, different domains of environmental responsibility and management will be discussed in order to emphasize the importance of a holistic approach to climate change and biodiversity loss mitigation. As has been concluded in the previous chapter, climate and biodiversity are interconnected, meaning that the successful implementation of the firm's environmental objectives contributes to supporting the local biodiversity levels. Hildreth (2012, 32) agrees that the importance and potential of biodiversity management is still overlooked in the companies' environmental performance. Thus, the ways of corporate biodiversity management will be discussed as a subsection, to outline the connection more rigidly and emphasize the impact of loss mitigation in enterprises.

Magerholm (2014,2) classifies a firm's environmental management objectives into environmental engineering, pollution prevention, and environmental conscious design and manufacturing on the micro-level, as well as industrial ecology and sustainable development on the macro level (i.e. the responsibilities that affect economy and society in addition to the environment). To justify the need for such objectives, the interactions of businesses with biodiversity and ecosystem services (BES) should be examined.

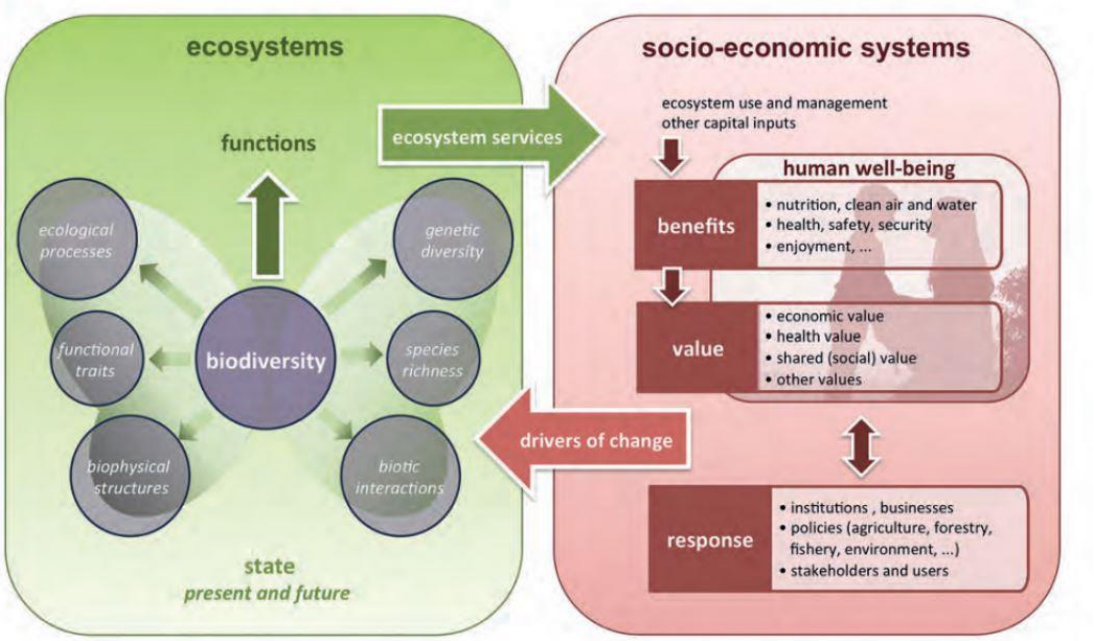

FIGURE 4. BES Conceptual Framework (Maes et al., 2013)

As can be seen from the Figure 4, not all ecosystem services are directly linked to the business activities and, as can be concluded, the true monetary value cannot be quantified precisely. As has been previously mentioned in the thesis, the Living Planet Report (2018, 10) estimates the value of BES at US$125 trillion annually. Moreover, depending on the governmental policies, some natural services can be either free of charge or not. For example, the Finnish people have a basic right to access nature at any point for free (Everyman's Rights or Jokamiehen Oikeudet), in contrast to Australia (Hancock, 2013, cited 28.03.2019) where the right to roam is partly limited, for example. Seeing that, the money flows from BES vary by country or even region.

Based on the Houdet's (2009,10) framework of general interactions, there are three interfaces of enterprises' involvement with the BES. Supply chain management, lead times, and the core materials used for the benefit of businesses are mentioned as the first part of the interaction. In this interface, companies try to eliminate any possible BES disservice and reinforce the benefits from exploitation of the ecosystems (e.g. rights to access water sources or use particular parts of the land). Based on the activities covered by this level of interaction, businesses manage their responsibility with regards to both the legal questions and stakeholder engagement, as described in the second interface. On this level, enterprises re-assess their strategies, objectives, values, or development choices with BES and quantify their impacts. It is tightly connected with the third

interface that accounts for managing and alleviating both positive and negative, direct and indirect impacts and re-adjusting the business practices. (ibid.)

3.1 Mitigation vs. Adaptation

According to the Living Planet Report (2018, 6), "Business and the finance industry are starting to question how global environmental risks will affect the macroeconomic performance of countries, sectors and financial markets…", meaning that the environmental performance can affect the success of business conditions in the long term. Thus, the switch from the traditional business operations is important not only from the perspective of conservation, but also from the perspective of economics and business opportunities. In this chapter, both climate change adaptation and mitigation strategies will be described for the long-term prosperity of organizations.

Essentially, climate change adaptation assumes the change of business strategies, suppliers, locations, or operation management practices to prevent the company from the losses related to the environmental conditions. For example, the production sites might be in the areas under the threat of flooding or the materials the business used to operate with are not as accessible anymore. From the perspective of biodiversity, the species recently taken under control and protection of the legislations require eco-tourism, fishing, and hunting-related enterprises to change their focus and practices (Houdet et al., 2009, 8). According to the authors (2009, 9), the business concerns on biodiversity and ecosystem services (BES) might include operational issues, brand image risks, problems with access to the needed materials, potential complete loss of the revenue source (e.g. in agriculture), as well as legal issues. Importantly, with the rise of sustainable finance, businesses adapted to the change have a higher chance of attracting investors due to the climate-proof strategy (ibid.).

In contrast to adapting, mitigating the impacts includes reversing the troublesome activities and leaning towards conservation. The constant dilemma behind assumes that complying with the current legislations does not necessarily mean taking environmental action. However, considering the growing attention to the reinforced environment-related policies, it can be assumed that climate adaptation might coincide with the climate mitigation at the point where businesses are legally expected to alleviate their impacts in addition to conforming to the currently existing laws.

Despite the abovementioned reasons for changes in the business practices, there are some reasons many companies still fail to recognize the importance of re-adjusting their activities. Herrmann and Guenther (2017,43) concluded that there are different barrier factors for climate adaptation of different companies: corporate knowledge, corporate (financial) resources, corporate objectives, corporate processes, collective knowledge, corporate incentives, and corporate culture. There might be a correlation with the climate mitigation barriers, considering that the factors are interdependent (2017,45) and assuming that the corporate objective sets a direction for either adaptation or mitigation measures in enterprises.

3.2 Consumer Behavior

As supply depends on demand, the buying behavior and consumption patterns enforced by the growth of the middle-class population increase the amounts of production and, thus, the amounts of resources used in the process. As has been mentioned in the previous chapters, increased buying power is one of the main drives of climate change.

According to the Living Planet Report data (2018,28), over-exploration and agriculture have led to 75% of wildlife decline, making it the main cause of the current biodiversity loss. It is largely affected by the invasive species from international business activities, such as shipping. The extent of shipping has been largely affected by globalization, since both B2B (e.g. outsourcing) and B2C (e.g. e-commerce) activities demand transportation of goods between the countries. In addition to burning large amounts of fuel, maritime shipping alone contributes to oil spillage, greenhouse emissions, as well as sound pollution that interrupts the life of marine species that rely on sound for orientation (Endresen et al., 2008, 1-36; Convention on Migratory Species, 2011, cited 20.02.2019). For instance, shipping accounted for 3.1% of annual global CO2 between 2007 and 2012 (IMO GHG, 2014, cited 20.02.2019). Thus, giving preference to locally-made products not only contributes to the local economy, but also alleviates the impacts on the environment. It is important to mention that even locally-made products might contain parts imported from an array of different countries where the supply chain expands.

As can be observed from Figure 3, the typical buying process in the consumer markets consists of 5 stages. However, not all purchase decisions are rational. As Žnideršić et al. (2014,82) argues, there are various reasons that lead to impulsive purchases, based on different external and internal

factors that vary from the store stylistic to personality traits, disposable income, and mood. According to the author (2014,85), low-priced products and discounts are the typical choices for the impulsive purchases. Such decisions are usually driven by instant gratification. It can be assumed that the impulsive buying decisions have a big contribution into the overconsumption, since the rational evaluation of alternatives is frequently missing from the process. Moreover, considering that the low-priced products are proven to increase the likelihood of such behavior, the materials used in the production and labor practices should be taken into consideration to understand the ways the company managed to cut the costs.

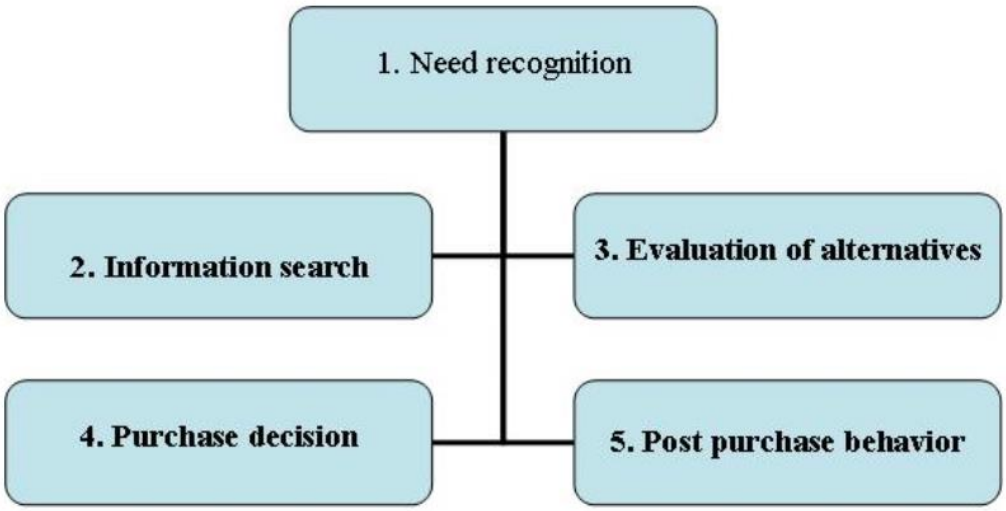

FIGURE 5. Consumer Buying Decision Process (Management Education, 2012, cited 26.02.2019)

The consumption patterns and buying behavior can be exemplified with the fashion industry, where fast and slow fashion, psychological drivers, and environmental impacts were extensively examined. Namely, fast fashion refers to the impulsive purchases that companies encourage through fast respond to the demand, big quantities, affordable prices, and trendiness (Kim et al.,2012, 244). Usually, such products are of lower quality and, consequently, life cycle. However, the typical fast fashion consumers do not have high expectations (Green Fashion Week, 2016, cited 25.02.2019) and strive for conformance with a trend rather than a style, in contrast to slow fashion consumers. According to the authors (2012, 245), such European brands increase their sales and profits by 20% every year, which leads to the enormous amounts of resources needed to satisfy the demand. Drawing a parallel to brands in the technology industry, fast fashion brands can be compared to lower-quality devices which are often accused of planned obsolescence. The term refers to the products specifically designed for a particular life span, with low opportunity for maintenance or part replacement (The Economist, 2009, cited 25.02.2019). Companies utilizing

such strategy expect the consumers to buy the product again, because of the affordable prices or no longer trendy (obsolete) design.

As Kim et al. (2012, 244) refers to Zavetovski (2002), the consumers aware of the consumption impacts on the environment and society have started to organize different movements, including anti-, 'green' and ethical consumerism. As can be seen from the Figure 4, the trend to purchase ethically-produced goods has been growing steadily in the UK between 1999 and 2015.

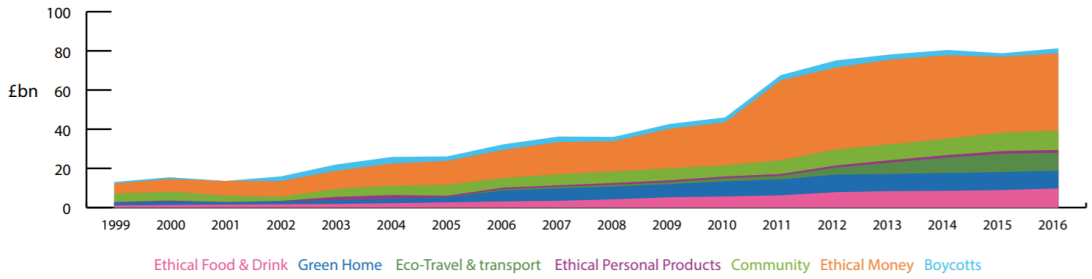

FIGURE 6. Ethical Spending in the UK,1999-2015 (Triodos Bank, 2017, cited 28.02.2019)

In addition to the ethical considerations, the growing circular consumption patterns in consumer markets contribute to the improvement of current environmental conditions.

3.3 Business Strategy

According to Nag et al. (2007, 935), strategic management is difficult to define. As the article (2007, 936-937) refers to Bowman and Thomas (2002), the field overlaps with the organizational theory, economics, finance, marketing, and sociology. According to Watkins (2007, cited 28.02.2019), the inability to identify strategic management and business strategy is one of the main reasons companies fail to have a clear plan of action. As the author exemplifies his vision of integrity in the Figure 5, business strategy stands for the ways in which its objectives are achieved.

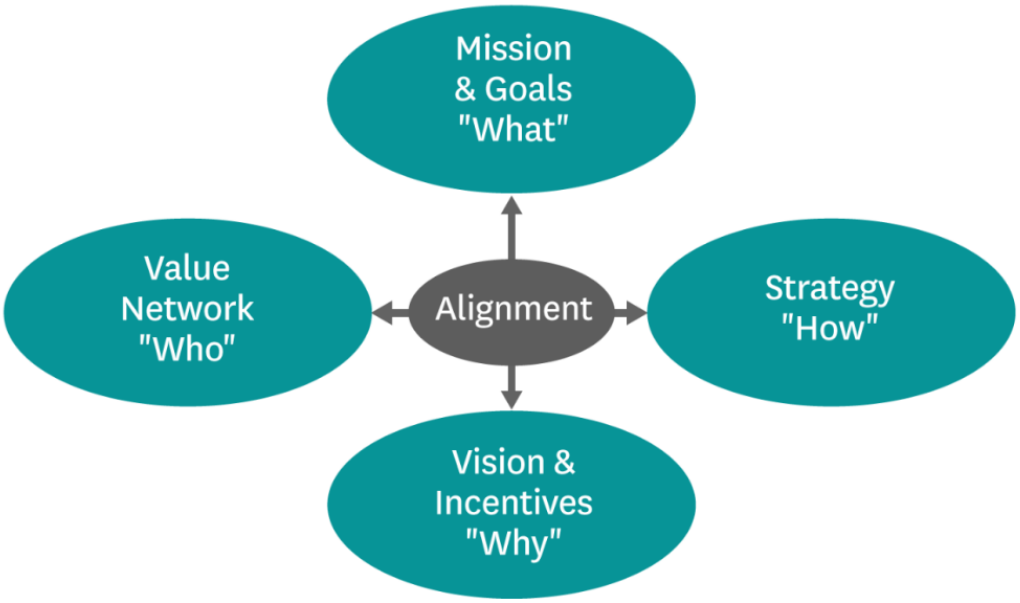

FIGURE 7. Business Strategy (Harvard Business Review, Watkins, M.D., cited 28.02.2019)

Given the mentioned definition of business strategy, the ways of achieving the business objectives expand to different departments of the business united with the common goals, vision, and value networks. Thus, it can be concluded that strategy refers to the current course of action in terms of a common guideline and steps necessary to achieve the planned objectives.

While the thesis is focused on the impact of business practices on climate change and biodiversity loss, the importance of climate change adaptation for sustainable growth and profitability should also be discussed (IPCC, 2014, cited 1.03.2019). Hildreth (2012, 33) claimed that some businesses have already understood that the effective waste and energy management can result in savings. Since the primary focus of the regulatory authorities has been on chemical pollution from the business operations, the fear of public scandals in this domain drives businesses to place more emphasis on this aspect of their activities. At the same time, biodiversity loss mitigation is still a relatively undiscovered competitive advantage. (ibid.)

Oliveira M.C. et al. (2017, 430) refers to Oliveira F.N. (2010): “existing trends suggest that social and business responsibility is seen as an additional expense to the organization; however, this impression is unfounded, given that it is an adequate path towards long-term success, providing the company with greater credibility.” Both authors agree that nowadays corporate responsibility is essential to withstand the competition in the long-term. As such, long-term vision, along with the

insights into the megatrends and possible future scenarios are an important part of a successful business strategy.

According to the analysis by Frost & Sullivan (2016, cited 3.03.2019), “smart if the new green”, “innovating to zero”, and well-being are the current megatrends that will still be on the rise in 2025 with moderate to high certainty. Consequently, the companies that strive to sustain their competitive advantage might need to re-consider their business strategies and align them with the new customer preferences.
For the purposes of this thesis, the essential parts of business strategy for climate change and biodiversity loss mitigation will be discussed in the upcoming subsections.

3.3.1 Environmental Accounting

Environmental Management Accounting process can be described as a part of decision-making processes in enterprises through collection and analysis of both environment-related monetary data (including assets and liabilities) and utilization data of raw materials, water, and energy (Houdet, 2009,6). According to the Ministry of the Environment (2002,1), accountability to stakeholders is crucial for businesses in establishing trust and public image, meaning that full disclosure of the environmental accounting data and transparency directly contribute to the brand image, which is important for both B2B and B2C activities. Magerholm (2014,3) classifies environmental accounting as a process-oriented environmental management tool.

The guidelines (2002,4) describe three elements essential for environmental accounting (EA): conservation cost (monetary value), conservation benefit (physical units, i.e. benefits for the environment and the company in question), and economic benefits associated with conservation activities (monetary value, i.e. impact on the company’s profits). According to the International Jasch (2009, 321-336), there is a wide scope of activities and contexts that can be covered by EA. In addition to the previously mentioned cases, the report mentions Full Cost Accounting that includes consideration of external impacts on the environment and Natural Resource Accounting. Houdet (2009,11) adds that accounting for material flows in biodiversity could be one of the responsibilities of environmental accounting.

The data obtained through EA methods can be utilized as a verifiable information about the firm's values not only for the stakeholders, but also for different certifications, such as ISO14001 or Green Office. Some certifications can further motivate firms towards the improvement of their activities through yearly examinations, along with conditions for the continuous development of their environmental performance.

3.3.2 Eco-marketing

As has been mentioned earlier, climate change and biodiversity related action plans in businesses can act as a competitive advantage. With the growing popularity of ethical consumerism, it is important for companies to consider the changing behavior, wants and needs of their markets. Focusing on the 'green' consumerism, value-driven social movement of consumers who give preference to the goods that do not endanger human well-being or the environment (Tekade & Sastikar, 2015, 308-312; Xie et al., 2014, 1-24), many companies have been public about their dedication to the environment. However, the greenwashing practices that started growing in the 80s (Watson, 2016, cited 27.02.2019) have made it more difficult to differentiate between the green products and companies that want to seem green (Handayani, 2017, 27). It can be assumed that reporting and transparency are the means of establishing trust with the customers aware of the greenwashing practices. For these purposes, certifications and acknowledgements from the recognized bodies also have an impact on attracting more skeptical potential buyers. In other words, the data has to be verifiable to sustain the brand image and represent integrity (i.e. alignment of business activities with its values and the representation).

As Handayani (2017, 26) refers to Polonsky (2011), eco-marketing can be implemented through the creation of new ways to present the values, educating the market about the importance of the consumer behavior, and reframing the desire for more goods to the satisfaction of our needs. The market education can be seen in the form of blogs and value-oriented advertisements, for example. The main purpose is to lobby the ideas and values promoted by the company, which contributes to the level of market awareness and can indirectly affect the climate and biodiversity conditions through the formed consumer opinions. Stakeholder engagement can eliminate the collective knowledge barrier to climate change adaptation (Herrmann & Guenther, 2017, 43). Thus, targeting the problem through the awareness levels affects not only the consumer behavior, but also the future practices of the competitors.

To conclude, eco-marketing is a tool that can affect the brand image for both B2B and B2C customers, partners, and future investors. Careful planning might result in the increase of profits and new competitive advantage for the business in question. In addition to the benefits in terms of business profitability, green marketing can be a way for enterprises to make a contribution to the levels of awareness and future decision-making at different levels of stakeholder engagement.

3.3.3 Supply Chain

Cooper et al. (1997, 1-13) defines supply chain management as "…an integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user." It is a complex system in which each supplier often has its own suppliers, making it difficult for companies to track the environmental performance and define each source. From the perspective of Croft, as referred to in the Living Planet Report (2018, 34), supply chains are the connection between the drivers of climate change (e.g. consumption), the pressures that they create, the state of the, and the resulting impacts (e.g. biodiversity loss). As indicated in the Figure 8, supply chains can have different structures and levels.

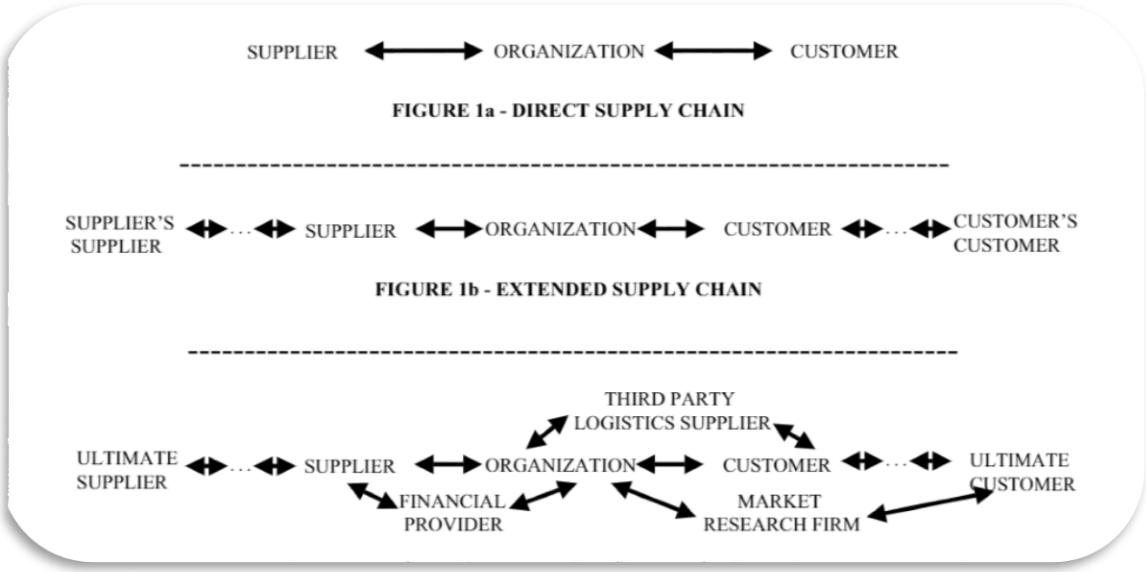

FIGURE 8. Types of channel relationships (Mentzer et al., 2011, cited 28.02.2019)

If the businesses aspire to grow and operate sustainably, they need to strive for a circular approach in the supply chain (Szaky, 2019, cited 10.03.2019) and for the control over where the product/material is coming from and where it goes to next. Most of the environmental management

tools that will be further described in section 3.4 are based on the insights from the supply chain (Magerholm, 2014, 1-12).

As claimed by Herrmann and Guenther (2012, 38-49), small and medium-sized enterprises (SMEs) comprise a substantial share of all suppliers. Since the lead times and supply chain are affected by the climate change, SMEs need to adapt their practices to the environmental conditions. As multinational enterprises (MNEs) have suppliers from different parts of the world, each delay might result in significant losses for the business and potential loss of their clientele. Thus, the usually more informed international companies with wider research potential have a responsibility to inform their channels of the need for climate adaptation or even threaten them of changing to more climate-proof suppliers. (ibid.)

Seeing that mitigation usually follows the adaptation process and, as has been mentioned in the previous chapters, is essential for both the image and operations of the companies, sharing knowledge and the insights into the current ecological situation is crucial for the continuous improvement.

It is important to note that biodiversity is also largely affected by the suppliers. Schaltegger (2012, 12) claims that the purchase of different materials, ranging from wood and plants to living organisms "impacts regions that often do not belong to the businesses benefiting from them". Moreover, the unprecedented invasion of alien species is one of the main reasons for habitat disruption. Even the land use choices directly impact the biodiversity loss by disrupting the natural habitat, since fragmenting the forests is considered to be one of the major threats to conservation nowadays. (Living Planet Report 2018, 38-65). Thus, controlling the supply chain and origins of the materials can be essential not only for the brand image, but also potential risk mitigation for the businesses that directly depend on the BES services.

3.3.4 Values and Employee Conduct

Value-driven organizations are proven to have higher employee satisfaction (Imperative, 2016, cited 1.03.2019). Moreover, the research from 2016 Work Purpose Index states that purposeful employees are more productive and, thus, 85% of value-driven companies increased their revenue between 2013 and 2016 (Imperative referring to E.Y. Beacon Institute and Harvard Business School, 2016).

The biggest part of labor market nowadays (Figure 9) - the millennial generation - is known for the heightened sense of purpose and desire for change and the belief that "business, not government, will have the greatest impact in solving society's most pressing challenges" (Dhar, 2014, cited 1.03.2019).

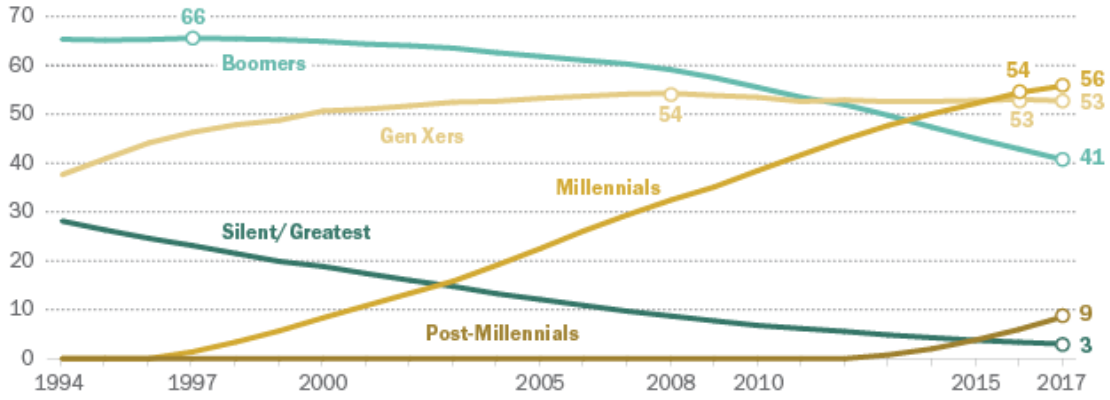

FIGURE 9. Millennials became the largest generation in labor force in 2016 in the US (Pew Research, 2018, cited 1.03.2019)

Engaging employees in the purpose-oriented environment not only increases the profitability (ibid.), but also aligns the company objectives with its operations and results in integrity, as has been discussed in the previous chapters. The importance of integrity lies in both the stakeholder trust and corporate resilience to change (PWC, 2013, cited 1.03.2019). As an example, in addition to the workplace employee conduct, American pet retail company Petco expects its partners to have environmental plans and use the resources efficiently, which is also stated in the company's Code of Ethics & Conduct (Petco, 2018, cited 1.03.2019).

In the context of this thesis, the climate adaptation and mitigation strategies are largely dependent on the awareness at all levels of the business hierarchy, based on the Herrmann's (2012) research on the barrier factors.

3.4 Tools and Frameworks

To start with, Starkey (1998, 26-27) defines the environmental policy as a part of the firm's environmental management (EM) frameworks and initiatives. Moreover, the author refers to the environmental charter subscriptions (1998, 29) as an optional way to demonstrate the values. Such commitments could provide clear common vision and background for further EM activities. It is also a part of the environmental management system (EMS) integration, such as ISO 14001 or EMAS,

set for standardization and continuous improvement of the firm (1998, 28; ISO, 2019 cited 1.03.2019).

As to the environmental data, single indicators are widely used in businesses due to their simplicity and easily communicated measures. According to OECD (2008, 7) the indicators are key tools for following the environmental progress, evaluating the success of policies and communicating values to the shareholders. They serve as an integral part of different reporting standards, including GRI (Global Reporting Initiative) where measures from different factors need to be calculated step by step. For example, GRI 302: Energy requires topic-specific disclosures on direct and indirect energy consumption (GRI Standards, 7-12). Depending on the specifics of a company, the units might vary. If applicable, the data can be further used for full assessments described further in the chapter.

Since most of the business operations emit CO2 equivalents directly or indirectly, carbon footprint measurement is one of the main tools used by companies nowadays. The calculations can further supplement full assessments mentioned below. It can be claimed that carbon footprint measurements are essential for a complete environmental management system (Carbon Trust, 2007, 7).

As to the full assessments that integrate and deepen the insights from the previously mentioned single indicators, Magerholm Fet (2014, 3) divides environmental management tools into process-oriented, product-oriented, and environmentally-conscious (i.e. targeted on the overall performance of the firm (2014,5). The author (2014, 8) refers to Fet (1997) in Figure 10, where the tools are classified into the scopes of concerns on different levels.

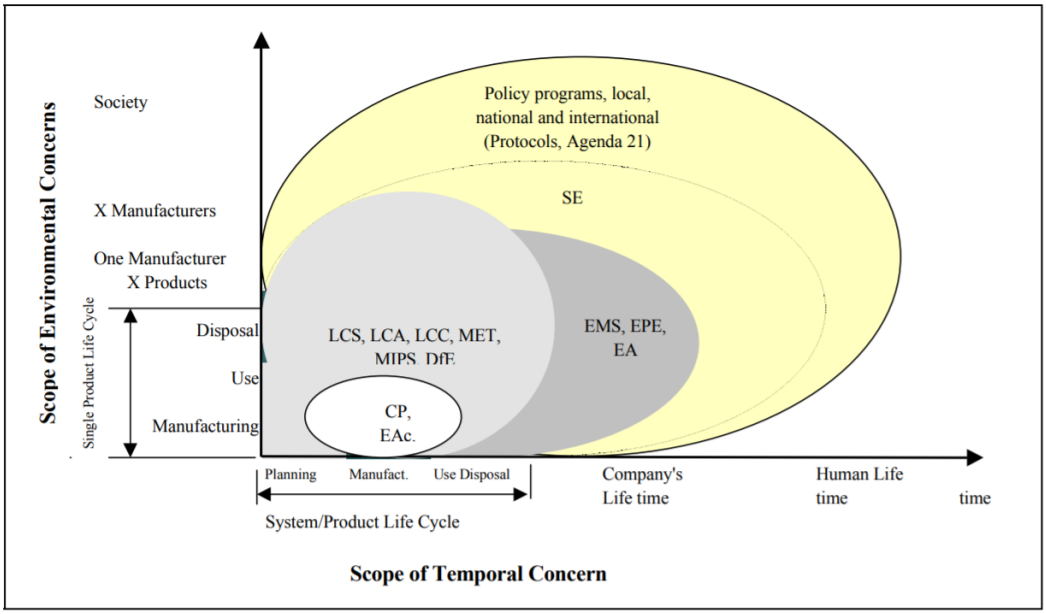

FIGURE 10. A classification of methods and tools for environmental performance improvements (Magerholm Fet, 2014; Magerholm Fet, 1997, cited 1.03.2019)

In the figure, CP (Cleaner Production) and EA (Environmental Accounting) are identified as the manufacturing concern, meaning that both of the tools are product-oriented. Essentially, the CP method does not have many differences from EA, except for focusing more extensively on effective waste and energy management while maximizing the final product output (Ali & Fresner, 2006).

Most of the product-oriented tools assess the product's lifecycle. Different perspectives are analyzed based on the chosen framework. For example, LCA (Life Cycle Assessment) focuses on defining the purpose and scope of analysis, inventory and impact assessment, and interpretation of the findings for the decision-makers (Magerholm Fet, 2014, 5). According to Starkey (1998, 28), LCA method is well described by the "cradle to grave approach", starting from the acquisition of raw materials for the chosen product, passing through the manufacturing process and its use, and ending at its final disposal (i.e. "grave"). Thus, it can also be described as a full disclosure of different inputs and outputs involved in the product's lifespan. The idea behind is to analyze the production and durability of the goods, find the areas for potential efficiency improvements, and possibly extend their lifecycle. For example, integration of the circular production, previously described in the thesis, could potentially extend the life time of the product beyond the disposal stage by maintaining, reusing, recycling, and redesigning the original version (World Economic Forum, 2019, cited 1.03.2019). The DfE tool (Product Development and Design for Environment) is responsible for creating the environmentally-friendly design based on the set requirements and

could be used for the transition to circular production. Magerholm Fet (2014, 4-5) refers to the US Environmental Protection Agency (1992) which created a life-cycle design approach where “need analysis, statement of requirements, design and implementation” are analyzed.

The LCS (Life Cycle Screening) and MET matrix, along with Life Cycle Costing, and MIPS (Material Input per Service unit), are considered to be the other tools requiring the “cradle to grave” approach. For instance, LCS is used to further research the potential improvements in some parts of the life cycle but cannot substitute the extensive LCA method. (ibid.).

As to MET, Berkel et al. (1997, 11-25) describes the tool as a 3*3 matrix with the correlation of Materials, Energy, and Toxicity with the production, use, and disposal stages of the life cycle. The matrix template can be seen on Figure 11. In contrast, LCC focuses on cost reduction through evaluation of different life cycle stages for the increased final output. Consequently, it is safe to assume that LCC method mostly analyzes cost-efficiency rather than the environmental effects. (ibid.).

	Production	**Use**	**Disposal**
Materials			
Energy			
Toxicity			

FIGURE 11. MET Template

As Magerholm Fet (2014, 4) refers to Liedke (1994) and Schmidt-Bleek (1993), the MIPS method focuses on the effective utilization of materials throughout the life cycle, instead of emphasizing the related waste, which is also important for the sustainable ideology. It is related to the Resource Management, wider environmentally-conscious instrument, embracing the material flows, product management, and design.

According to the Figure 8, all the mentioned tools are product-oriented. Starkey (1998,28) adds that the Ecobalance assessment is also based on the physical resource inputs, utilization, and outputs based on the life cycle data, and acts as one of the requirements for the ISO 14001 and EMAS certifications.

Both Starkey (1998,29) and Magerholm Fet (2014,5) describe EL (Eco-Labeling) as the verification of the product's excellent environmental performance based on the verifiable data collected from different assessments. Mostly, it is used as a marketing tool for the value-driven customers (1998,29), which can be assumed to improve the overall transparency of the company. Another widely used way to showcase the value-oriented performance includes environmental reporting, which could significantly improve the stakeholder trust (1998, 28-29).

The environmental-conscious management tools focus on the environmental performance throughout the company's life-time (Figure 8) and include such instruments as EMS (Environmental Management Systems), EA (Environmental Auditing), and EPE (Environmental Performance Evaluation). Magerholm Fet (2014,5) agrees with Starkey (1998,28) that the EMS and EA could secure the company's continuous improvement. They provide a documented proof of how successfully the firm's environmental objectives are met (2014, 5). The EMS were previously mentioned in the thesis as optional certifications by the recognized authorities.

Last not least, EPE is based on the EPIs (Environmental Performance Indicators) that signify changes in the overall environmental data over the chosen period of time and can be used to track the improvements both compared to the past performance of the firm and the performance of its competitors (ibid.).

3.5 Corporate Biodiversity Management

There are many approaches to mitigate biodiversity loss in business, which overlap with environmental management. However, Hildreth (2012, 32) perceives biodiversity management as a still undiscovered competitive advantage. The idea was further described by Schaltegger (2012,10) who presents opportunities and risks related to the issue, which could possibly act as an incentive for companies to participate in the change.

For example, biodiversity loss mitigation could improve the brand image, add value to the provided products and services, and possibly attract the rising group of ethical consumers (2012, 22). According to the Corporate Biodiversity Management Flow diagram (2012, 11) attached as Appendix 2, reputation, amount of sales, risk mitigation, innovation, costs, and business model are the primary case drivers for companies. Both Houdet (2009, 9) and Schaltegger (2012, 10) agree

that many businesses, especially the ones directly related to the wildlife population, are decreasing the business risks by implementing more sustainable strategies. On the example of fisheries, Schaltegger (2012, 10) claims that biodiversity management could be crucial for long-term success.

As has been briefly mentioned in the Environmental Accounting section of the thesis, the tool can be extended into different areas of business objectives and, in this case, can be used for the biodiversity management. Most of the tools described by Schaltegger (2012, 44-51) involve tailoring the previously mentioned environmental management framework, such as company guidelines, environmental impact assessment, and market education, for the biodiversity action. For instance, the author also suggests auditing for the success of a firm's biodiversity-related objectives and legal compliance, setting checklists for action plans, encouraging corporate volunteering, implementing biodiversity indicators and ratios (both for the current biodiversity state and the impact of each business activity on its state), evaluating the suppliers, participating in compensatory programs, and conducting biodiversity SWOT (ibid.).

Referring to the biodiversity indicators, the Living Planet Report (2018, 100) identifies the need to use various methods and data for the complete understanding of the situation. Based on the currently available technology and monitoring opportunities, the Living Planet Database collects information from 3,268 various sources to create the Living Planet Index, according to the report. It also refers to different indicators and up-to-date statistics that can be used by businesses.

4 CASE STUDIES

As has been previously mentioned, the thesis includes two research questions: What environmental initiatives do the chosen companies have? Why are they efficient, based on the industry analysis? To answer the latter question, the theoretical background and data published by the industry associations is used.

For the purpose of the research, 3 Finnish industries are analyzed. In order to make a valid comparison, each of the chosen industries – travel & transportation, paper, and food – is represented by 2 different companies whose environmental reports are extensively examined later in the chapter. The respective data and reports were retrieved from the websites of the companies and can be accessed by the public. To ensure the validity of the research, only the newest available data was included in the analysis. Due to the different reporting practices, some of the newest reports were published as early as 2015. Thus, the research refers to the Finnair's Sustainability Report 2018, VR's Annual Report 2015 (website), Fazer's Annual Report 2018, Valio's Sustainability Report 2017, Stora Enso's Annual Report 2018, and Metsä Group's Sustainability Report 2018 in the key findings section.

The research attempts to not only compare the environmental initiatives and indicators used by two competing businesses, but also explain their choices based on the literature background and typical approaches in the local industry (information from the reports, research, and websites of the respective Finnish associations).

4.1 Overview and Key Findings

In this section, environmental frameworks and initiatives of different companies and their departments are examined more extensively. For instance, the following criteria is analyzed: supply chain, market education activities, environmental management tools and frameworks, as well as biodiversity management and voluntary environmental certifications. The industry specifics are presented alongside the company analysis, to justify the choice of their initiatives.

4.1.1 Transport Industry

Finnair Oyj (public stock company) and VR Group (governmentally-owned) were chosen to represent the travel & transportation industry. Even though the companies are not considered to be direct competitors, they showcase the scope of the industry and, hence, the differences and similarities of their climate change mitigation methods.

In the annual sustainability report, Finnair identifies jet fuel emissions, energy consumption, noise pollution, and cabin waste as the key environmental impacts of the business. As a part of the Global Reporting Initiative, the company divides its impacts into sub-categories related to the direct and indirect energy consumption (including heating), biodiversity (which is influenced by not only the environmental conditions, but also flight noise that can disorient the species), greenhouse gas emissions, and waste. All the data is further supplied with environmental initiatives set to help Finnair achieve its targets. As a flight operator, the company consumes most of the energy in form of jet fuel where the renewable alternatives are not yet applicable. (Finnair, 2018, 18-27). From the point of the theoretical review, Finnair's environmental strategy is focused on mitigation, meaning that the eco-efficiency is under continuous development set to alleviate the troublesome impacts of its operations. Different from adaptation, where the company adjusts its business to climate change for the sake of stability, mitigation strategies include initiatives taken beyond the scope of long-term business growth.

In contrast to Finnair, Finnish railway company VR only starts introducing the mitigation activities. Based on the data from 2015, climate change and resource depletion are included into the list of managerial concerns, meaning that the implementation of more climate-proof, or adaptation, strategies was already recognized as an objective for the company's long-term success (VR, cited 20.04.2019). Nevertheless, VR recognizes energy consumption, exhaust emissions, and waste as the main environmental impacts of its business and starts projects towards their alleviation. The company follows GRI reporting initiatives which, however, are not published in a structured manner.

	Finnair (2018 data)	VR (2015 data)
Agenda	Fuel efficiency & renewable fuels, biodiversity management & noise reduction, plastic elimination, recycling	Energy efficiency & renewable energy, elimination of chemical leaks, reduction of waste to be landfilled, recycling
Supply Chain	Strict responsibility guidelines and control for the potential suppliers; Sedex system (defined further in the chapter) Meetings and events for increasing environmental awareness	55% of competitive tenders are based on environmental criteria (2015); Centralized monitoring; 98% of local or EU suppliers
Market Education	Environmental Calculator for the customers; Active reporting & Promotion of biodiversity conservation	-
EM Tools & Assessments	Energy efficiency & intensity indicators; Greenhouse gas indicators, including carbon footprint; Waste indicators	Energy efficiency & intensity indicators; Greenhouse gas indicators, including carbon footprint; Waste indicators
Biodiversity	Promotion of biodiversity conservation; Control of origins of raw materials; Evaluation and control of the relevant ecosystem services and company impacts	-
Environmental Certifications	IATA - Environmental Assessment (IEnvA) Stage 2 certification (ISO 14001:2005 equivalent for airlines)	ISO 14 001 Standard (for the main operations)

TABLE 1. Environmental Responsibility at Finnair and VR

As can be seen from the Table 1, due to the specifics of the transport industry, energy efficiency (including fuel) has been continuously identified as the major concern on the agenda of both companies. As a state-owned company, VR complies with the objectives set by the Finnish Transport Agency which lists more eco-friendly infrastructure as one of the development areas. The plan describes reduction of greenhouse gas emissions from the contributing sources (including the energy consumption and waste), as well as reduction of noise and vibration. (Finnish Transport Agency, 2017, cited 25.04.2019). As can be seen from the table, nearly every concern is covered in the VR's environmental agenda. The operations of Finnair are more related to the Mission Aviation Fellowship, Finnish association that currently focuses on discovering new opportunities and technology that could help combat the environmental impact of air traffic (Mission Aviation Fellowship, 2019, cited 25.04.2019). In line with these objectives, Finnair identifies the investments into more environmentally-friendly fleet as the biggest climate action taken by the company (Finnair, 2018, 11).

When it comes to the supply chain, both companies implement strict guidelines and monitoring for their sources. For example, Finnair introduced the Sedex (Supplier Ethical Data Exchange) self-assessment system for most of their key suppliers. The tender criteria are not mentioned in the report, in contrast to VR who are currently working on increasing the percentage of deals made with environmental consideration. At the same time, Finnair strives to overcome the collective knowledge barrier to climate change adaptation practices (Herrmann & Guenther, 2017, 43) by creating continuous dialogue with its suppliers, which has been previously mentioned in this thesis as an important initiative. Finally, the report claims that the Finnair's suppliers are located all over the world, while the VR's current operations are mostly supported by local/EU companies.

As to the market education, no information has been mentioned on the VR's website. It does, however, consider the greener brand image (calculated as the % of the survey participants who view VR as environmentally-friendly) to be one of the objectives for the current sustainability plan. Consequently, market education could help the company not only improve the awareness levels, but also support the desired brand image and achieve the set target. Moreover, more structured reporting practices could help the company communicate the values with all shareholders. It is important to add that the company had a video and a different sustainability page for the Finnish language speakers, represented on Figure 12. Thus, it can be assumed that the marketing education activities are stronger for the Finnish customers.

FIGURE 12. Sustainability page of VR for the Finnish language speakers (VR, cited 3.05.2019)

In this domain, Finnair has taken many initiatives throughout the years of its operation. In addition to creating the environmental calculator for its customers, to visualize and assess the personal contribution on the emission levels, the company provides options of different charity contributions and compensation programs that would help equalize the produced emissions. An example of calculations for a random destination (Helsinki - Amsterdam) is presented in the Figure 13.

Finnair also promotes biodiversity conservation, including educating the customers who fly to the sensitive biodiversity areas about the responsible behavior and potentially harmful excursions.

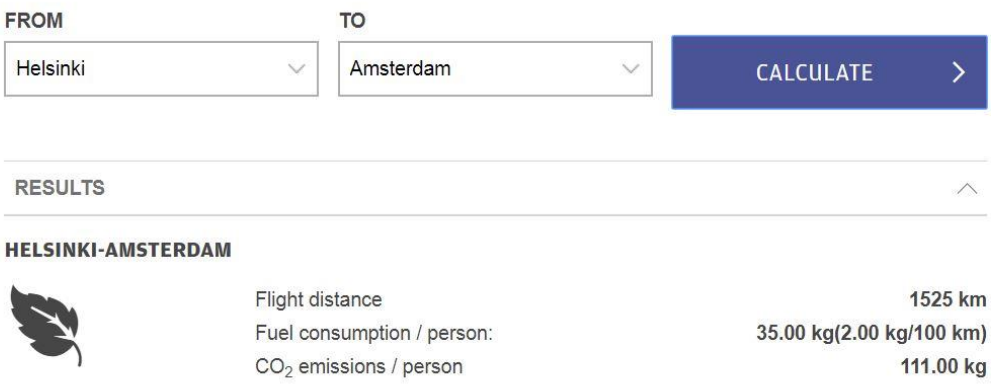

FIGURE 13. Emissions Calculator (Finnair, cited 3.05.2019)

Due to the similar business specifics, both companies use the same environmental indicators. Nevertheless, methods of calculation and the units might vary. For example, Finnair uses RTK (revenue tone kilometer i.e. capacity use based on the payload weight) in relation to the carbon footprint and other environmental indicators. VR, on the other hand, calculates the impact per passenger or tonne kilometer. Such variables prove that similar environmental indicators can have different measurement values, depending on the specifics of business operations.

According to the report, Finnair not only promotes biodiversity conservation, but also tracks the impacts of its practices and performs their assessment on regular basis. The company has also identified responsible sourcing of raw materials as one of the related key issues. Thus, it can be assumed that the company has already started seeing biodiversity management as the competitive advantage, previously mentioned in the thesis as still barely discovered. The VR's initiatives have not been listed, which makes the comparison impossible to implement. It can also mean that the company does not manage its impacts on biodiversity, which would then prove that biodiversity management is still overlooked in businesses.

Considering the environmental management efforts of both service providers, Finnair and VR are covered by the equivalent environmental standards. While Finnair's operations are fully certified, some parts of VR are still to be improved. Moreover, the green brand image target set by VR could be positively affected by complete certifications. As companies operating in the energy-intensive transport industry, both businesses could also benefit from ISO 50001, which stands for energy-efficiency.

4.1.2 Paper Industry

The situation is different when it comes to paper mills that directly exploit the ecosystem services and operate in B2B markets. In this thesis, the industry is represented by Stora Enso and Metsä Group. Due to the direct dependence on BES, there are many concerns related to their activities: raw materials, water, and energy consumption, waste management, carbon dioxide reduction, land use and, consequently, impact on biodiversity (Stora Enso, 2018, 31; Metsä Group, 2018, 38). Due to the high-volume production practices and complex international logistics, both companies produce a lot of emissions on different stages of their value chain.

	Stora Enso (2018 data)	Metsä Group (2018 data)
Agenda	Waste management, raw materials & energy efficiency, land use & sustainable forestry, biodiversity management	Resource & energy efficiency, sustainable supply chain, reduction of emissions, circular production, sustainable forestry, biodiversity management
Supply Chain	76% of wood suppliers are certified; Special guidance: Supplier Code of Conduct; Control over the relevant certifications; Sustainability criteria in every tender	88% of the wood suppliers are certified; Contracts binding the suppliers to operate sustainably; Promotion of the certifications & possible consultancy
Market Education	Compliance declarations; Promotion of sustainability on stakeholder forums	Compliance declarations; Sharing the expertise with shareholders
EM Tools & Assessments	Greenhouse gas indicators, including carbon emissions (per saleable tonne); Water, Electricity & Heat consumption indicators (per saleable tonne of board, pulp, paper); % of the managed lands covered by certifications; Life Cycle Assessments	Greenhouse gas indicators, including carbon emissions (by business area); Water indicators (per product tonne); Eutrophication & acidification (by bus area); Raw material utilization; Energy efficiency indicators; % of the managed lands covered by certifications; Life Cycle Assessments
Biodiversity	Sustainable forestry & long-term planning through monitoring; Traceability systems	Biodiversity stumps: create nesting trees for the birds in places where they operate; Controlled burning of regeneration areas

Environmental Certifications	ISO 14001; Ecolabels (>90% of paper); Sustainable Biomass certification program; International Standard on Assurance Engagements (ISAE) 3000 & 3410	ISO 14001 (Environmental Management), ISO 50001 (Energy Management); Ecolabels

TABLE 2. Environmental Responsibility of Stora Enso and Metsä Group.

Based on the agenda of the businesses, most of their objectives overlap. Even though sustainable supply chain and circular production are peculiar for the plans in Metsä Group, it can be seen from the operations of Stora Enso that at least the sustainable supply chain is present in the development areas. For instance, the supply chain practices of both companies show strict control and monitoring of the suppliers, according to the data presented in Table 2. Currently, both companies use sustainability (including the environmental action) criteria in the competitive tenders. Moreover, Metsä Group is involved into consultancy of their suppliers, which is especially important with small to medium-sized enterprises where the level of awareness or financial resources can be scarce (Herrmann & Guenther, 2017, 45). All of the mentioned measures are especially important in the forest industries, including paper and pulp production. The image of companies directly related to exploitation of ecosystem services is tightly dependent on the transparency in their operations and supply chain, due to the rising importance of sustainability and the deteriorating environmental situation.

The market education activities of both companies are limited by sustainability promotion. In this case, Metsä Group might be assumed to perform stronger due to their expertise sharing practices mentioned in the sustainability report. Moreover, the company exemplifies its activities with correspondence to different Sustainable Development Goals, as defined by UN, which can contribute to the levels of sustainability awareness. On the other hand, both companies operate in B2B markets where, as could be assumed, activities outside sustainability promotion or knowledge sharing might be viewed as redundant by the representatives of their bigger customers.

According to the data presented in Figure 14, the Finnish forestry in general has been improving its environmental performance over the last few decades. As can be seen from the listed environmental indicators used by the two companies, both track their impact on different domains

analyzed by the Finnish Forest Industries Federation in the graph. The only difference between the methods used by the businesses are the units: Stora Enso calculates the impact per saleable tonne of their product, while Metsä Group calculates it by business area or produced product tonne, depending on the specific indicator.

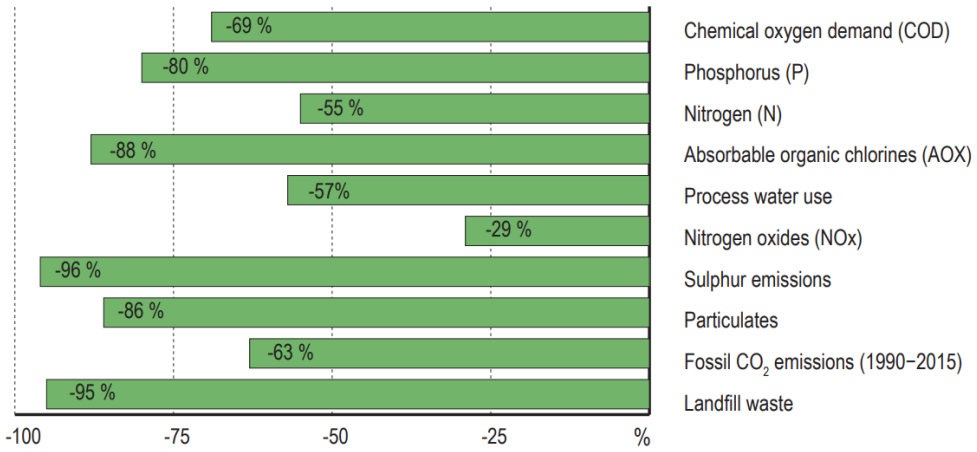

FIGURE 14. Emission reductions proportioned to production 1992-2015 in the pulp and paper industry in Finland (Finnish Forest Industries Federation, 2017, cited 25.04.2019)

In addition, both Stora Enso and Metsä Group perform full Life Cycle Assessments due to their production activities. As has been mentioned in Chapter 3.4 (Tools and Frameworks), it can be further used to find previously overlooked inefficient processes, specifically harmful environmental activities, and general production steps that could be improved to potentially extend the product life cycle.

It is important to note that, though operating in similar industry, Stora Enso and Metsä Group have different approaches to biodiversity management. As such, the first company is actively using various monitoring and traceability systems referred to as highly important in Chapter 3.5 (Corporate Biodiversity Management). Stora Enso uses the received insights for long-term planning and management of their forest activities. The company is able to adjust the wood harvesting techniques for each area, to make it as safe as possible in terms of the local wildlife. While the tools used for biodiversity management were not mentioned in the report of Metsä Group, the company fully describes its solutions and initiatives taken to reverse their impact. For instance, it preserves the bird population by creating nesting trees, so that they do not lose shelter and opportunity to procreate in the areas of firm's operations. As the means of forest and, consequently, habitat

preservation, Metsä Group implements controlled burning of the preservation areas to prevent heat-induced fires. Compared to the other companies mentioned in the case studies, both businesses seem to focus on biodiversity management the most. It can be linked to the industry specifics, where all activities can potentially harm the local wildlife if not carefully planned or implemented. In this case, it can be assumed that biodiversity management is rather a requirement than competitive advantage, due to the strict control over the forestry in different countries and, especially, Finland (Figure 15).

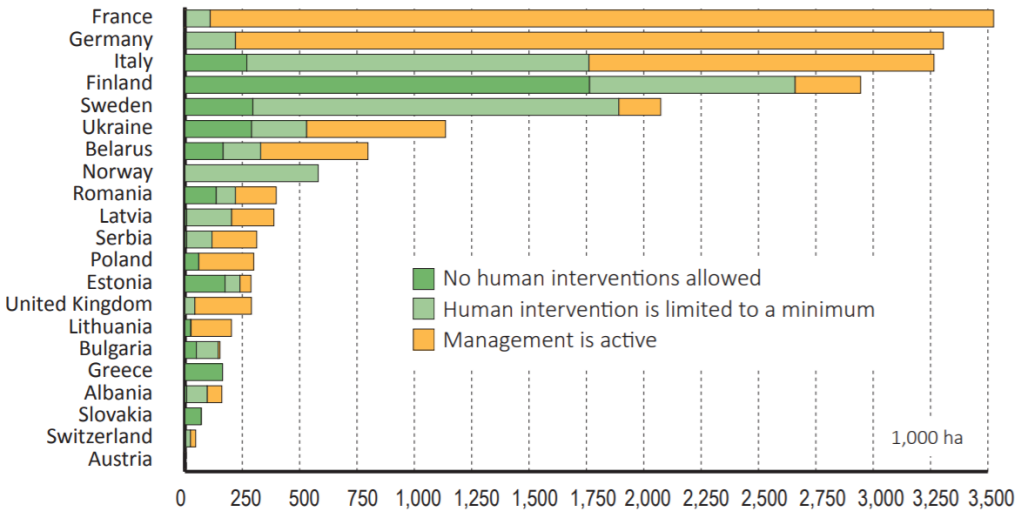

FIGURE 15. The strictness of forest protection in Europe (State of Europe's Forests, 2017, cited 25.04.2019)

Last not least, both companies are fully certified by ISO 14001, recognizing the continuous development of their environmental management systems. As can be seen from the table, Metsä Group is also covered by the ISO 50001 (Energy Efficiency). When it comes to the other standards, Stora Enso participates in the Sustainable Biomass certification program as well as International Standard on Assurance Engagements (ISAE) 3000 & 3410. The latter recognizes the availability and transparency of the companies' environmental information, as well as the managerial processes and the environmental performance (ICAEW, 2016, cited 25.04.2019). Both companies use eco-labels that, as has been mentioned previously in the thesis, not only improve the brand image, but also contribute to the responsible consumer choices. It is impossible, however, to compare both companies on the percentage of products covered by the labels, due to the lack of such insights in the report by Metsä Group. In the BES-related industries, certifications might be essential for the potential customers, suppliers, and investors.

4.1.3 Food Industry

The food industry is analyzed on the case of Finnish diary company Valio and versatile foodservice provider Fazer. Even though the scope of both organizations is different, the similarities between their environmental management methods are visible in the key findings. Both of the companies are ISO 14001-certified, suggesting that their dedication to continuous improvement is recognized by the international standards. Valio specifies water and energy use, as well as wastewater load as the main environmental aspects related to their activities (Valio, 2017, 4-72). Moreover, as a diary producer, the company is highly concerned about the animal welfare and biodiversity (2018, 11). Fazer is faced with similar concerns, except for the wastewater load, which is especially relevant in the milk-processing companies (Slavov, 2017, 14-28). As has been mentioned in the thesis, the food industry directly exploits the biodiversity and ecosystem services.

As can be seen from the comparative data in Table 3, Valio might be stronger when it comes to the supply chain control, especially to prioritizing the local suppliers. For instance, the research by the Finnish Food and Drink Industries' Federation (2018, 14) considers the improved self-sufficiency of the national production as one of the main objectives. On the other hand, Fazer cannot get exclusively local procurement due to the demand on such ingredients as cocoa in its production. Thus, comparing the two companies based on the supply chain management, especially with the lack of available data, is impossible.

Both companies perform market education initiatives that, however, do not put enough stress on the importance of responsible consumer behavior. As has been mentioned in the Chapter 3.2 (Consumer Behavior), the dialogue between companies and their customers is important for the future of climate change mitigation. In this case, Fazer's promotion of food waste reduction is more applicable. Nevertheless, Valio's reports are more informative and complete, which improves the level of stakeholder awareness.

	Valio (2017 data)	Fazer (2018 data)
Agenda	Circular production, waste management, water & energy consumption efficiency, animal welfare	Emissions reduction, resource efficiency, food waste reduction, plastic use reduction, animal welfare, biodiversity and sustainable agriculture
Supply Chain	Transparent procurement; Mostly local suppliers (84%); Supplier auditing; Route optimization	Sustainability requirements; Continuous monitoring; Sharing expertise
Market Education	Promoting information on well-being; Ethical Advisory Board (increase the transparency of milk production and deliver the information to the stakeholders); Reporting practices	Promoting food waste reduction; Reporting practices
EM Tools & Assessments	Material, water & energy consumption indicators; greenhouse gas emissions, including CO2 equivalents; Waste indicators; Chemical use; Life Cycle Assessments	Material, water & energy consumption indicators; Waste indicators; Carbon footprint
Biodiversity	Soy-free production (because forests are cut for the soybean cultivation); free grazing for cows	No deforestation for the key raw materials; Cocoa & Forest Initiative (re-empowered procurement practices)
Environmental Certifications	ISO 14001	ISO 14001 (Environmental Management) & ISO 50001 (Energy Management) - partly

TABLE 3. Environmental Responsibility of Valio and Fazer

Both companies use single environmental indicators in their reports, similarly to the companies analyzed before. Due to the previously mentioned less extensive report by Fazer, it is assumed that the company does not implement Life Cycle Assessment. At the same time, even though it might strengthen the supply chain control, LCA in food production is resource- and time-consuming

with wide margins in the results (Satpute, 2013, 561), which might not always be worth the finances otherwise allocated to other environmental performance assessments and improvements.

As has been previously mentioned, over-exploration and agriculture are the main cause of biodiversity loss (75% of all lost species) (Living Planet Report, 2018, 28). According to the reports, Valio and Fazer track the direct and indirect land use to prevent deforestation and disruption of the natural habitat. Due to the specifics of the food industry, both companies could implement further conservation activities that would create a new competitive advantage.

Finally, the sustainability report of Fazer described the Environmental Certifications more precisely, indicating the standards and the respective facilities. Not every part of the business is ISO-certified, which can mean either lack of continuous environmental improvement or lack of need for the certification. While Valio's operations are completely covered by ISO 14001 (Environmental Management), the same assumption can be made about the lack of ISO 50001 (Energy-Efficiency): either the energy consumption is to be improved or the certification does not bring the added value to shareholders. The certifications are especially important in production, including the highly competitive food industry. Thus, further improving some facilities and potentially applying for the remaining optional certifications could contribute to the perception of the companies. Furthermore, with the rising popularity of organic food (Smithers, 2018, cited 29.04.2019), eco-labels could be implemented for the long-term competitiveness and impowered brand image in the perception of an average consumer.

4.2 Summary

Based on the analysis of 6 Finnish companies and the related industries, it can be assumed that the environmental awareness in the chosen cases is sufficient. Most of the companies have already started the climate change mitigation activities, meaning that the management understands their importance from both the perspective of responsibility and long-term business success. Nevertheless, most of the chosen case studies represent big Finnish corporations that are largely dependent on the responsible brand image, meaning that the same level of awareness might not apply to the smaller local enterprises or other, less ethical, corporations. Thus, it cannot be assumed that all Finnish companies in the analyzed industries have the same awareness level. Moreover, it cannot be assumed that the most influential companies in all countries follow the same

environmental objectives or standards. The awareness levels in the chosen organizations can be attributed to the local business culture and awareness levels in Finland as a whole, as one of the top-ten countries in the Environmental Performance Index (Environmental Performance Index, 2018, cited 30.04.2019).

All the analyzed companies describe control and transparency of the supply chain as one of the managerial objectives in the reports. As can be concluded from the key findings, environmental criteria are also used in the competitive tenders by most of the chosen organizations, suggesting that the percentage of more ethical suppliers is only going to grow. Importantly, even ecologically-friendly sourcing might create a great amount of pressure on the environment, depending on the location of the supplier. Thus, the companies who strive to improve their performance further, need to not only consider the responsibility of their suppliers, but also optimize the routes and seek for local procurement when possible. One of the further essential development areas could be circular production, which has not been covered in the agenda and reports in most of the cases.

As to the market education activities, some of the analyzed companies could be more proactive. While all of them perform at least some type of reporting initiatives, they are mostly targeted at investors and business partners, rather than regular consumers. Moreover, some of the companies, specifically Fazer and VR, could improve their reports in terms of structure and informativeness. It is important to note that all of the cases had a sustainability page on their websites, describing some of the goals and activities. However, the amount of material and its content varies on some of the websites if the language is switched, as has been discussed on the example of VR.
A possible reason for the lack of educational activities could be the fear of customers' prejudice towards environmental promotion based on their awareness of the greenwashing practices. Nevertheless, some potential suggestions for the improvement in this domain could be organizing webinars, educational events, or interactive campaigns that would promote ethical consumerism, for example. If greenwashing is what the companies fear, then they need to find an honest and innovative way of engaging the consumers and gaining their trust. For example, US-based premium outdoor apparel company Patagonia disclosed their environmental impacts and, consequently, the impact of buying one piece of clothing in the 'Don't Buy This Jacket' campaign that can be seen in the Appendix 3.

When it comes to the environmental assessments, it can be concluded that all of the chosen companies actively use single environmental indicators. First of all, they are easy to use in the

reports and simple to understand for the reader, in contrast to more complicated calculations. Second of all, some of the calculations are too time-consuming and redundant, depending on the specifics of operations. It is important to note that full assessments are not a prerogative to assessing the impacts, as long as the single indicators represent all the needed values for the company development. However, most of the chosen businesses have Environmental Management departments that implement more complex assessments used for internal development rather than stakeholder communications. When disclosed, such calculations showcase the secrets of business processes that could be further used by competitors. Thus, some of the tools and frameworks mentioned in Chapter 3.4 are most probably used for the internal development of the chosen enterprises but not applicable for the public disclosure.

As has been previously claimed in the thesis, biodiversity management is still an undiscovered competitive advantage. While most of the companies participate in some initiatives, most of them could be improved further. At the same time, the awareness about the importance of biodiversity preservation and business impacts is present in the companies. As a suggestion for potential improvements, more companies could implement deeper analysis of their operations that could harm biodiversity. Moreover, using monitoring and traceability systems would help companies visualize their impacts the same way as they already do with the environmental performance.

Finally, all of the chosen companies are at least partly covered by internationally-recognized environmental management certifications. Considering that the chosen industries and the size of the businesses are very energy-intensive and produce a lot of waste, applying for voluntary standards and certifications (e.g. ISO) is more useful in the stakeholder communications than it sometimes is in the smaller enterprises.

5 QUESTIONNAIRE MATERIAL

As a part of the development task, the questionnaire materials are designed to test the general knowledge of the students on the basic data about the climate change and biodiversity loss situation. Since the thesis is written in cooperation of OAMK and WWF, the students need to carefully examine the data presented from the Living Planet Report 2018 to complete the questionnaire.

The Environmental Responsibility course (Ympäristövastuullisuus, 5 cr) is only available for the registered participants, while "Living Planet: Environmental responsibility guide for business students & enterprises" is accessible for everyone on the Moodle platform: https://moodle.oamk.fi/course/view.php?id=6101.

Not only students, but also company representatives are able to use the materials for their personal interest and further applications within the management. However, the business questionnaires have a deeper focus on the managerial tools and implications, in addition to the level of awareness tested in students. The test can be taken by the link indicated above using guest access. The password is: LivingPlanet.

5.1 Student Questionnaire

1) Currently, what is the dominant cause of the species loss?
    a. Plastic & chemical pollution
    b. Global water use
    c. Over-exploration & agriculture
    d. Oil drilling & spillage

    Note to answer a, b, and d: While all of these issues affect the species, over-exploration and agriculture account for 75% of the damage (Living Planet Report, 2018, 28)
2) What is the main driver of climate change?
    a. It happens naturally from time to time
    b. Poor environmental performance of businesses
    c. Lack of recycling facilities
    d. Runaway consumption rates

3) What does Ecological Footprint stand for?
    a. **It is a measure that tracks how much demand human consumption places on the biosphere**
    b. It is a measure that tracks the amount of emissions from all human activities
    c. It is a measure that tracks the amount of species lost to the human activities
    d. It is a measure that tracks monetary losses connected to the deteriorating ecological situation
4) How does accelerated human development influence the Ecological Footprint?
    a. It improves the ecological situation
    b. **It deteriorates the footprint**
    c. It is not connected to the footprint measures
    d. There is no information on their correlation

    Note for the answers a, c, and d: The accelerated human development, resulting in the growing amounts of the middle-class, has increased the consumption power and, consequently, the demand we place on the nature (Living Planet Report, 2018, 22).
5) What is the major threat to biodiversity conservation?
    a. Soil erosion
    b. **Forest fragmentation**
    c. Pollution
    d. Pesticide use
6) What is the approximate value of the natural services per year (US$)?
    a. **$125 trillion**
    b. $200 trillion
    c. $50 trillion
    d. $30 trillion
7) What are the biggest threats to biodiversity?
    a. Invasive species and species over-exploration
    b. Climate change and pollution
    c. Habitat degradation
    d. **All of the above**

    Note for answers a, b, and c: All of the listed problems are considered to threaten the current biodiversity state, according to the Living Planet Report (2018, 74)
8) What is one of the ways climate change affects businesses?
    a. **It puts the macroeconomic situation and the financial markets at risk**

b. It increases the amount of business opportunities
c. It does not have any direct impact
d. It has not been mentioned

Note for answers b, c, and d: Even though there are many ways businesses can be affected by climate change (depending on the specific activities and resources they operate with), the Living Planet Report (2018, 6) particularly mentions the impacts of climate change on the economics and financial markets, which affects all companies equally.

9) True or False: Supply chains are the connection between the drivers of climate change, the pressures that they create, the state of the ecology, and the resulting impacts
   a. True
   b. False
   c. It has not been mentioned
10) How much of land on Earth is affected by the human activities?
   a. 94%
   b. 52%
   c. 75%
   d. 61%

Note for answers a, b, and d: According to the Living Planet Report (2018, 42), only one fourth of the planet is free from the influence from human activities.

5.2 Business Questionnaire

1) How can businesses enter the circular economy?
   a. Improving the durability of the product
   b. Making the product components replaceable
   c. Using recycled materials
   d. All of the above
2) What is Sustainable Development?
   a. Climate action
   b. Mutual development of the society, economy, and the environment
   c. Steady economic growth of a company or a government
   d. Development that includes wildlife preservation
3) What is one of the ways climate change affects businesses?

a. **It puts the macroeconomic situation and the financial markets at risk**
b. It increases the amount of business opportunities
c. It does not have any direct impact
d. None of the above

4) What is environmental management?
a. Any initiative taken to improve the environmental performance of a firm
b. Management in which business strives to use organic produce
c. It is a process required for green certifications and implemented by promoting eco-consumerism and educating the employees about the current issues
d. **Systematic procedures that include monitoring, summarizing, and communicating the firm's environmental initiatives**

5) What does integrity mean in business?
a. **It means alignment of business activities with its values and the representation**
b. It is the environmental initiatives businesses implement for the long-term success
c. It is a tool for increasing the transparency of business operations
d. Both choices b and c are correct

6) What is eco-marketing?
a. Promoting the company as green and sustainable
b. Making all people want to buy the greener alternatives
c. **Reframing the desire for more goods to the satisfaction of our needs**
d. Educating the market about sustainability to increase the corporate profits

7) Why are systematic performance measurements important?
a. They help businesses track the progress towards their environmental targets
b. They help businesses create comprehensive reports and establish shareholder trust
c. They help businesses notice the areas for potential improvements in terms of environmental responsibility
d. **All of the above**

8) How do businesses affect biodiversity?
a. Directly, when operating in the industries exploiting the ecosystem services
b. Indirectly, e.g. by producing emissions that harm the environment and, consequently, habitats

c. They do not have any effect on biodiversity, and the only initiatives taken to conserve it are to create added value for the customers

d. Answers a & b

9) Why is climate change adaptation important?

a. It helps business operate responsibly

b. It helps business secure essential resources for the future

c. It helps business conserve biodiversity

d. It helps business created added value for the customers

Note for answers a, c, and d: while climate change adaptation could induce some responsibility, the adaptation strategies are mostly targeted at securing the existence of essential resources for the long-term success of the business in addition to having a climate-proof strategy in the eyes of investors.

10) True or false: environmental impacts of the chosen suppliers are indirect impacts of the business itself?

a. True

b. False

6 CONCLUSION

Climate change and biodiversity loss are ongoing issues, driven by runaway consumption and the growth of the middle-class globally (Living Planet Report, 2018, 22). That is why it is important for companies to adapt to the changing environment in order to secure their essential resources and competitiveness in the future, as well as discover climate action as a competitive advantage and mitigate the troublesome impact of business activities. In addition to the responsible operations, it is in the capacity of the companies to empower responsible consumption and educate their customers about the impacts of their buying choices.

Based on the case studies, the chosen Finnish companies have already started the mitigation activities that influence the decision-making process of all departments. As previously mentioned, environmental responsibility has to be considered in every part of the business to not only efficiently track and reach the performance targets, but also create shareholder trust by transparency and integrity.

The analysis proved that, depending on the industry and the business specifics, the initiatives and environmental management methods vary. Nevertheless, all of the potential development areas and departments described in the theoretical background have been covered in the sustainability reports of the case studies, even though the scope and approaches are different (depending on particular operations, financial resources, values etc.). Thus, the thesis can potentially serve as an introductory guide to corporate responsibility in companies starting mitigation activities or targeting environmentally-minded markets.

The research has proven that most of the reviewed companies have not discovered biodiversity as a competitive advantage, proving the claim made by Hildreth (2012, 33) earlier in the thesis. Nevertheless, the businesses include biodiversity management into their objectives, meaning that the problem is recognized and mitigated by many. Considering the biodiversity loss trends, the respective actions might both help reverse the alarming extinction rates and help companies target and gain trust of new customers, such as animal protection activists.

Lastly, it can be assumed that the Finnish companies are more responsible on the global scale, because of the general awareness levels and the ethical business culture in the country. However,

it cannot be claimed that businesses and organizations from less environmentally-minded governments necessarily underperform. Improving the education activities both on the governmental and business level could drive responsible consumption, affect the future decision-makers and, consequently, the environmental performance of their businesses. Seeing that, countries that improve the awareness levels might have higher demand and opportunities for environmentally-friendly organizations. The related initiatives could help eliminate collective knowledge barrier to climate change adaptation and, consequently, mitigation strategies based on the factors described by Herrmann and Guenther (2017, 44). Thus, education is important for both the future businessmen and regular consumers in pursuit of climate change mitigation.

7 DISCUSSION

The writing process has had its difficulties and challenges. Especially, the scope of the guide was rather difficult to define, which then turned into an opportunity to show the width and different applications of environmental responsibility.

The most challenging part of the thesis was finding a convenient and efficient data collection method to gather interesting insights about environmental responsibility in organizations. At first, the intention was to conduct a few interviews with representatives of some Finnish companies. However, it was impossible to reach them neither via email nor through direct calls. This method might have worked if I started trying to reach the representatives earlier, in the very beginning of the writing process.

At the same time, the reports contained a lot of data that was very interesting for me to analyze and compare. Of course, this method included its own limitations. For example, the companies use different reporting systems, and some of them do not have complete reports. Even those with more or less comprehensive information might have some initiatives not mentioned in the material. It makes it impossible to compare some of the variables, since claiming that a company is not working on particular area only based on the lack of information would not be professional or fair.

It would be interesting to get further insights from the companies' representatives on each of the analyzed initiatives and, possibly, fill in some of the gaps limited by the current research method. Moreover, then it would be possible to interview them about some internal tools used in environmental management, for example.

Even though there have been some issues with the research and planning, the thesis was presented within the intended timeline. Despite the challenges, it has been an interesting experience and learning process that enriched my skills as an aspiring researcher in the future.

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ECOSYSTEM SERVICES AND THEIR EXAMPLES

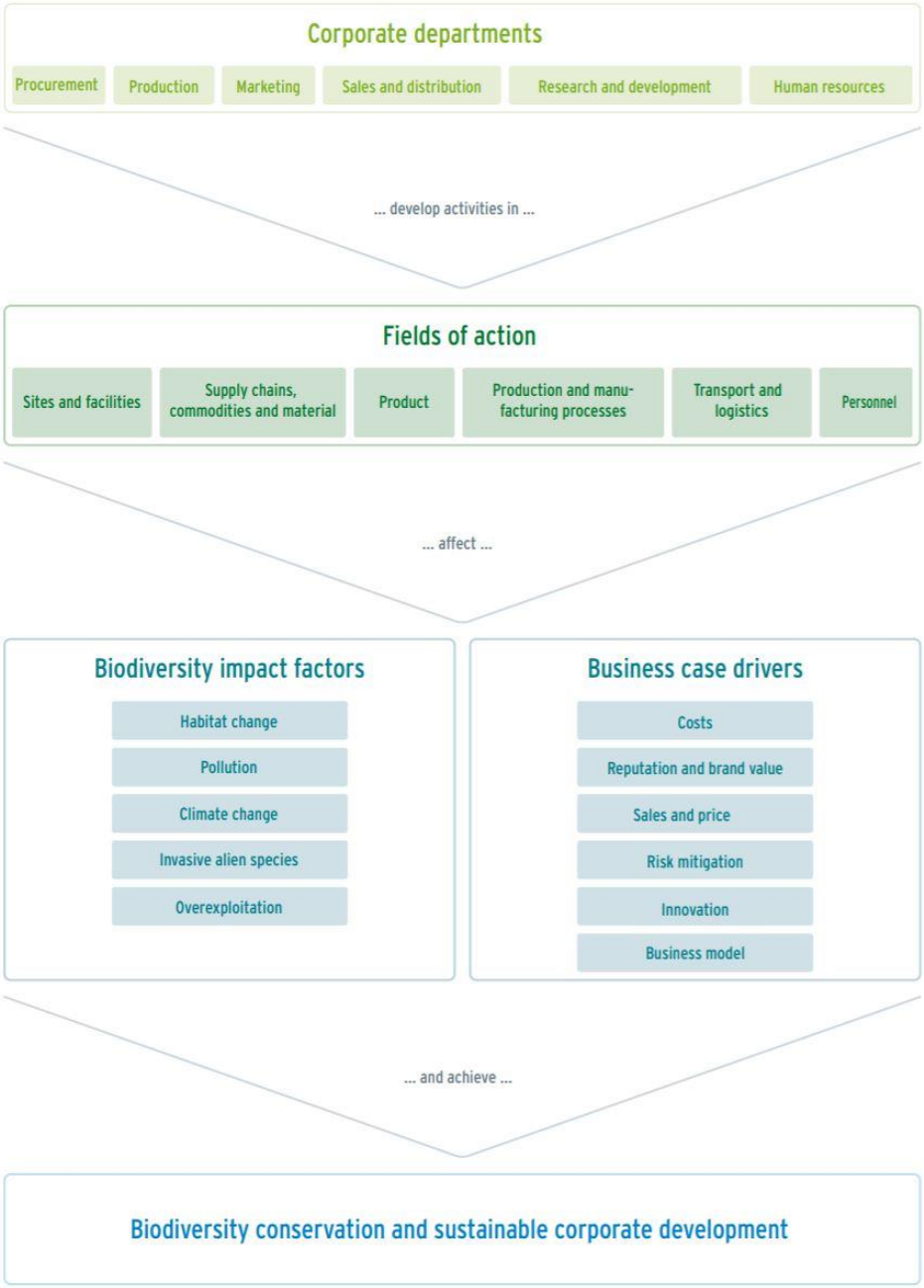
APPENDIX 1

Table 1.1: MA categories of ecosystem services and examples

Category	Examples of ecosystem services provided
Provisioning services i.e. products obtained from ecosystems	• Food e.g. crops, fruit, fish • Fibre and fuel e.g. timber, wool • Biochemicals, natural medicines and pharmaceuticals • Genetic resources: genes and genetic information used for animal/plant breeding and biotechnology • Ornamental resources e.g. shells, flowers
Regulating services i.e. benefits obtained from the regulation of ecosystem processes	• Air-quality maintenance: ecosystems contribute chemicals to and extract chemicals from the atmosphere • Climate regulation e.g. land cover can affect local temperature and precipitation; globally ecosystems affect greenhouse gas sequestration and emissions • Water regulation: ecosystems affect e.g. the timing and magnitude of runoff, flooding etc. • Erosion control: vegetative cover plays an important role in soil retention/prevention of land/asset erosion • Water purification/detoxification: ecosystems can be a source of water impurities but can also help to filter out/decompose organic waste • Natural hazard protection e.g. storms, floods, landslides • Bioremediation of waste i.e. removal of pollutants through storage, dilution, transformation and burial
Cultural services i.e. non-material benefits that people obtain through spiritual enrichment, cognitive development, recreation etc	• Spiritual and religious value: many religions attach spiritual and religious values to ecosystems • Inspiration for art, folklore, architecture etc • Social relations: ecosystems affect the types of social relations that are established e.g. fishing societies • Aesthetic values: many people find beauty in various aspects of ecosystems • Cultural heritage values: many societies place high value on the maintenance of important landscapes or species • Recreation and ecotourism
Supporting services, necessary for the production of all other ecosystem services	• Soil formation and retention • Nutrient cycling • Primary production • Water cycling • Production of atmospheric oxygen • Provision of habitat

Source: Department for Environment, Food and Rural Affairs (DEFRA). 2007. An introductory guide to valuing ecosystem services. London: Defra Publications, 11

CORPORATE BIODIVERSITY MANAGEMENT FLOW DIAGRAM APPENDIX 2



Source: Schaltegger, S. & Beständig, U. 2012. Corporate Biodiversity Management Handbook: A Guide for Practical Implementation. Berlin: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), 10-51

DON'T BUY THIS JACKET

It's Black Friday, the day in the year retail turns from red to black and starts to make real money. But Black Friday, and the culture of consumption it reflects, puts the economy of natural systems that support all life firmly in the red. We're now using the resources of one-and-a-half planets on our one and only planet.

Because Patagonia wants to be in business for a good long time – and leave a world inhabitable for our kids – we want to do the opposite of every other business today. We ask you to buy less and to reflect before you spend a dime on this jacket or anything else.

Environmental bankruptcy, as with corporate bankruptcy, can happen very slowly, then all of a sudden. This is what we face unless we slow down, then reverse the damage. We're running short on fresh water, topsoil, fisheries, wetlands – all our planet's natural systems and resources that support business, and life, including our own.

The environmental cost of everything we make is astonishing. Consider the R2® Jacket shown, one of our best sellers. To make it required 135 liters of water, enough to meet the daily needs (three glasses a day) of 45 people. Its journey from its origin as 60% recycled polyester to our Reno warehouse generated nearly 20 pounds of carbon dioxide, 24 times the weight of the finished product. This jacket left behind, on its way to Reno, two-thirds its weight in waste.

And this is a 60% recycled polyester jacket, knit and sewn to a high standard; it is exceptionally durable, so you won't have to replace it as often. And when it comes to the end of its useful life we'll take it back to recycle into a product of equal value. But, as is true of all the things we can make and you can buy, this jacket comes with an environmental cost higher than its price.

There is much to be done and plenty for us all to do. Don't buy what you don't need. Think twice before you buy anything. Go to patagonia.com/CommonThreads or scan the QR code below. Take the Common Threads Initiative pledge, and join us in the fifth "R," to reimagine a world where we take only what nature can replace.

COMMON THREADS INITIATIVE

REDUCE
WE make useful gear that lasts a long time
YOU don't buy what you don't need

REPAIR
WE help you repair your Patagonia gear
YOU pledge to fix what's broken

REUSE
WE help find a home for Patagonia gear you no longer need
YOU sell or pass it on*

RECYCLE
WE will take back your Patagonia gear that is worn out
YOU pledge to keep your stuff out of the landfill and incinerator

REIMAGINE
TOGETHER we reimagine a world where we take only what nature can replace

Source: Patagonia, 2011, cited 25.04.2019, https://www.patagonia.com/blog/2011/11/dont-buy-this-jacket-black-friday-and-the-new-york-times/